

Claims

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1. A method of assigning agents of an automatic call distributor to incoming calls of a plurality of call types handled by the automatic call distributor, such method comprising the steps of:
- 5
- determining a target occupancy matrix including a target occupancy for each agent of the agents of the automatic call distributor for each call type of the plurality of call types;
- 10
- processing a call of a first type of the types determined in the target occupancy matrix; and
- assigning the call to an agent of the agents of the automatic call distributor with a largest relative difference between an actual occupancy of calls of the first type handled by the agent and the target occupancy of calls of the first type determined for the agent in the target occupancy matrix.
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2. The method of assigning agents as in claim 1 further comprising generating the target matrix from permanent, semi-permanent and variable data.
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3. The method of assigning agents as in claim 2 wherein the step of generating the target matrix from the permanent data further comprises defining a plurality of work types where each work type characterizes at least some of the incoming call types.
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4. The method of assigning agents as in claim 3 wherein the step of generating the target matrix from the permanent data further comprises providing a list

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of agent skill types required for each work type of the incoming call types.

5. The method of assigning agents as in claim 4  
5 wherein the step of generating the target matrix from the permanent data further comprises providing a minimum agent skill level required by each work type of the incoming call types.

10 6. The method of assigning agents as in claim 5 wherein the step of generating the target matrix from the semi-permanent data further comprises providing a skill level of each agent with respect to each skill type required by each work type of the incoming call  
15 types.

7. The method of assigning agents as in claim 6 wherein the variable data further comprises manually providing a target occupancy level for at least some  
20 agents of the target matrix.

8. The method of assigning agents as in claim 7 wherein the step of generating the target matrix further comprising randomly assigning work type  
25 occupancies to each agent of the plurality of agents within the target matrix.

9. The method of assigning agents as in claim 8 wherein the step of randomly assigning work type  
30 occupancies to each agent of the plurality of agents within the target matrix further comprises iteratively repairing the target matrix.

10. The method of assigning agents as in claim 9  
35 wherein the step of iteratively repairing the target

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matrix further comprises sequentially selecting an agent and randomly selecting a work type.

11. The method of assigning agents as in claim 10  
5 wherein the step of sequentially selecting an agent and randomly selecting a work type further comprises assigning a fractional occupancy of the agent to the randomly selected work type, thereby generating a new target matrix.

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12. The method of assigning agents as in claim 11  
wherein the step of sequentially selecting an agent and randomly selecting a work type further comprises calculating a change in an objective function of the  
15 new target matrix.

13. The method of assigning agents as in claim 12  
wherein the step of calculating a change in an objective function of the new target matrix further  
20 comprises adopting the new target matrix as the repaired matrix when the calculated change is less than zero.

14. Apparatus for assigning agents of an automatic  
25 call distributor to incoming calls of a plurality of call types handled by the automatic call distributor, such apparatus comprising:

means for determining a target occupancy matrix including a target occupancy for each agent of the  
30 agents of the automatic call distributor for each call type of the plurality of call types;

means for processing a call of a first type of the types determined in the target occupancy matrix;  
and

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means for assigning the call to an agent of the agents of the automatic call distributor with a largest relative difference between an actual occupancy of calls of the first type handled by the agent and the target occupancy of calls of the first type determined for the agent in the target occupancy matrix.

15. The apparatus for assigning agents as in claim 10 14 further comprising means for generating the target matrix from a plurality of permanent, semi-permanent and variable data.

16. The apparatus for assigning agents as in claim 15 15 wherein the means for generating the target matrix from the permanent data further comprises means for defining a plurality of work types where each work type characterizes at least some of the incoming call types.

17. The apparatus for assigning agents as in claim 16 wherein the means for generating further comprises means for providing a list of agent skill types required for each work type of the incoming call types.

18. The apparatus for assigning agents as in claim 17 wherein the means for generating further comprises means for providing a minimum agent skill level required by each work type of the incoming call types.

19. The apparatus for assigning agents as in claim 18 wherein the means for generating further comprises means for providing a skill level of each agent with

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respect to each skill type required by each work type of the incoming call types.

20. The apparatus for assigning agents as in claim  
5 19 wherein the means for generating further comprises means for manually providing a target occupancy level for at least some agents of the target matrix.

10 21. The method of assigning agents as in claim 15 wherein the means for generating the target matrix further comprising means for randomly assigning work type occupancies to each agent of the plurality of agents within the target matrix.

15 22. The apparatus for assigning agents as in claim 21 wherein the means for randomly assigning work type occupancies to each agent of the plurality of agents within the target matrix further comprises means for  
20 iteratively repairing the target matrix.

23. The apparatus for assigning agents as in claim 22 wherein the means for iteratively repairing the target matrix further comprises means for  
25 sequentially selecting an agent and randomly selecting a work type.

24. The apparatus for assigning agents as in claim 23 wherein the means for sequentially selecting an  
30 agent and randomly selecting a work type further comprises means for assigning a fractional occupancy of the agent to the randomly selected work type, thereby generating a new target matrix.

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25. The apparatus for assigning agents as in claim  
24 wherein the means for sequentially selecting an  
agent and randomly selecting a work type further  
comprises means for calculating a change in an  
5 objective function of the new target matrix.

26. The apparatus for assigning agents as in claim  
25 wherein the means for calculating a change in an  
objective function of the new target matrix further  
10 comprises means for adopting the new target matrix as  
the repaired matrix when the calculated change is  
less than zero.

27. Apparatus for assigning agents of an automatic  
15 call distributor to incoming calls of a plurality of  
call types handled by the automatic call distributor,  
such apparatus comprising:

28. a matrix processor adapted to determine a target  
occupancy matrix including a target occupancy for  
20 each agent of the agents of the automatic call  
distributor for each call type of the plurality of  
call types;

29. a call processor adapted to process a call of a  
first type of the types determined in the target  
25 occupancy matrix; and

30. a call distributor adapted to assign the call to  
an agent of the agents of the automatic call  
distributor with a largest relative difference  
between an actual occupancy of calls of the first  
type handled by the agent and the target occupancy of  
calls of the first type determined for the agent in  
the target occupancy matrix.

B 28. The apparatus for assigning agents as in claim 27 further comprising a plurality of permanent, semi-permanent and variable data.

5 29. The apparatus for assigning agents as in claim 28 wherein the permanent data further comprises a plurality of work types where each work type characterizes at least some of the incoming call types.

10 30. The apparatus for assigning agents as in claim 29 wherein the matrix processor further comprises a list of agent skill types required for each work type of the incoming call types.

15 31. The apparatus for assigning agents as in claim 30 wherein the matrix processor further comprises a minimum agent skill level required by each work type of the incoming call types.

20 32. The apparatus for assigning agents as in claim 31 wherein the matrix processor further comprises a skill level of each agent with respect to each skill type required by each work type of the incoming call types.

25 33. The apparatus for assigning agents as in claim 33 wherein the matrix processor further comprises a manually entered target occupancy level for at least some agents of the target matrix.

30 34. The method of assigning agents as in claim 33 wherein the matrix processor further comprising a selection processor adapted to randomly assign work

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type occupancies to each agent of the plurality of agents within the target matrix.

35. The apparatus for assigning agents as in claim  
5 34 wherein the selection processor further comprises a repair processor adapted to iteratively repair the target matrix.

36. The apparatus for assigning agents as in claim  
10 35 wherein the repair processor further comprises an ~~objective~~ <sup>objective</sup> function processor adapted to calculate a change in an objective function of the new target matrix.

37. The apparatus for assigning agents as in claim  
15 36 wherein the objective function processor further comprises a update processor adapted to adopt the new target matrix as the repaired matrix when the calculated change is less than zero.

38. A method of assigning a plurality of agents to incoming calls by an automatic call distributor, such method comprising the steps of:

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determining a target matrix specifying a mix and proportion of call types to be handled by each agent of the plurality of agents;

receiving and assigning calls based upon the mix and proportion of call types specified in the target matrix with agent selection based upon an actual  
30 occupancy of the target matrix by the agent and a relative difference between the actual occupancy and the target matrix.